REMARKS

Upon entry of the present amendment, claims 1 and 3-12 will remain pending in the above-identified application and stand ready for further action on the merits.

Claim 1 has been amended so as to further clarify that the zirconium silicate beads employed in the present invention have a spherical shape.

No new matter is being introduced by the present amendment. For example, the amendment to claim 1 is based on the disclosure at Table 1 on page 7 of the instant specification.

Further, the instant amendment does not raise substantial new issues for the Examiner's consideration and require no further search on the Examiner's part. At the same time, the instant amendments put the pending claims in condition for allowance and into a more proper format for issuance in a United States patent, by overcoming all outstanding rejections and objections of record.

Proper consideration of each of the pending claims (i.e., claims 1 and 3-12) is respectfully requested at present, as is entry of the present amendment.

Claim Rejections under 35 USC § 102 and § 103

At pages 2-3 of the Office Action, claims 1, 3 and 6-12 have been rejected under 35 USC § 102(b) as being anticipated by Kani US '758 (US 5,098,758).

Further, at pages 3-4 of the Office Action, claims 1 and 3-12 have been rejected under 35 USC § 103(a) as being unpatentable over Kani US '758 as applied to claims 1, 3 6-12 and further in view of Kani US '193 (US 4,777,193).

Reconsideration and withdraw of each of these rejections is respectfully requested based on the following considerations.

The Present Invention and its Advantages

In the non-asbestos friction material of the present invention comprising a fibrous base, a binder, a filler and an abrasive, the abrasive includes zirconium silicate beads having a spherical shape and an average particle size of 15 to 500 μm, thereby having good coefficient of friction characteristics, yet minimizing noise and mating surface attack. As described at "Prior Art" of page 1 of the instant specification, in conventional art, the particles of zirconium silicate generally employed for this purpose were produced from zircon sand as the starting material by milling, deironing and classification and they helped confer the material with a high coefficient of friction. However, the zirconium silicate had a tendency to cause noise and mating surface attack (when included in a friction material) because they produced angular and irregular shapes.

In the present invention, by employing the zirconium silicate beads having a spherical shape and an average particle size of 15 to 500 μm, some advantages, such as good coefficient of friction characteristics, mating surface wear and noise performance, are successfully attained.

Distinction over Kani US '758

At first, Kani US '758 fails to disclose or suggest "zirconium silicate beads having a spherical shape and an average particle size of 15 to 500 μm", which is a feature of the present invention. Further, Kani US '758 does not give any consideration to the specific shape.

In conventional art, the particles of zirconium silicate generally used for this purpose are produced from zircon sand as the starting material by milling, deironing and classification. Since the zirconium silicate thus produced are angular and of irregular shape, they have a tendency to cause noise and mating surface attack when included in a friction material. In the working Examples Comparative Examples of instant specification, the differences between the present invention and prior art (i.e., Kani US '758) are described. For example, each of Comparative Examples 2 and 3, where not spherical zirconium but milled zirconium is employed in the composition, shows larger mating surface wear (μm) and poor noise performance. It is reasonable interpretation of those of ordinary skill in the art that a friction material disclosed in Kani US '758 corresponds to the results in Comparative Examples 2 and 3 in view of the shape of the zirconium silicate used in the frictional material.

Next, Kani US '758 discloses at column 3 that as the inorganic filler constituting the resin mold base member, two types of fillers (i.e., a soft filler such as calcium carbonate and a hard filler such as zirconium silicate) are used in order to make the securing of the friction coefficient of the resin mold base member compatible with the attack tendency thereof against the mating component.

However, the constitution of Kani US '758 is the combination of two types of fillers which are a soft filler such as calcium carbonate and a hard filler such as zirconium silicate. That is, Kani US '758 teaches that not only zirconium silicate but also a soft filler (such as calcium carbonate) must be used as fillers. On the other hand, according to the present invention, the object (e.g., good coefficient of friction characteristics, minimizing noise and

mating surface attack) can be achieved even if a soft filler such as calcium carbonate is not employed.

Thus, the structure of the present invention is distinguished from that of Kani US '758.

Therefore, the present invention is distinguished from the composition of Kani US '758. The detailed means for solving the problem such as noise performance and mating surface attack is different from each other. While the composition of Kani US '758 has the combination of soft and hard fillers, the present invention is remarkable for the shape of zirconium silicate. Thus, the constitution for solving the problem is different from each other. Accordingly, Kani US '758 fails to disclose or suggest the present invention and the effects thereof.

The present invention (claim 1) is distinguished from Kani US '758.

Accordingly, the present invention is not anticipated by Kani US '758.

Distinction over Kani US '193

Kani US '193 also fails to disclose or suggest "zirconium silicate beads having a spherical shape and an average particle size of 15 to 500 μm", which is a feature of the present invention. Further, Kani US '193 does not give any consideration to the specific shape and the specific particle size of zirconium silicate beads.

Accordingly, the Kani US '193 reference dose not give one skilled in the art any motivation to reach the present invention.

Combination of the Cited References

A *prima facie* case of obviousness is not established even if the cited references are combined since none of the cited references disclose or suggest the feature of "zirconium silicate beads having a spherical shape and an average particle size of 15 to 500 μm", which is recited in claim 1. Likewise, it follows that a person having ordinary skill in the art would not be motivated by any of the teachings of the cited references to arrive at the present invention.

Accordingly, the cited art does not provide any motivation to arrive at the instant invention as claimed, and moreover the instant invention possesses unexpected and advantageous properties not rendered obvious by the cited art.

Accordingly, the present invention (independent claim 1 and dependent claims) is not obvious over the cited references.

Unexpected Result of the Present Invention

Further, the present invention has unexpected result over the cited references.

In view of good coefficient of friction characteristics, mating surface wear and noise performance, the technical significance of the shape and the average particle size of zirconium silicate in the present invention is further clarified when Examples and Comparative Examples described in the instant specification are compared. Especially, in view of the inventive effects as described above, there is a significant difference between spherical particles and non-spherical particles of zirconium silicate.

For instance, in Example 3 and Comparative Example 2, the both zirconium silicates have an average particle size of 50 μm but different shape (i.e. spherical particles in Example 3;

non-spherical particles in Comparative Example 2). The result of Comparative Example 2 is that an amount of wear on the mating surface (non-spherical zirconium silicate) is more than 20 μm (poor) and the noise performance is poor. On the other hand, Example 3 shows the excellent properties. (See Table I below, which is prepared based on Table 1 on page 7 of the instant specification.)

Also, in the comparison between Example 5 and Comparative Example 3 wherein both of the average particle size are 100 μm but the shape of the particle is different each other, an amount of wear on the mating surface (non-spherical zirconium silicate) is more than 20 μm (poor) and the noise performance is poor in Comparative Example 3. On the other hand, Example 5 shows the excellent properties. (See Table II below, which is prepared based on Table 1 on page 7 of the instant specification.)

Therefore, the present invention has advantages, which are not disclosed and suggested in Kani US'758 and Kani US'193 references.

Accordingly, the present invention (independent claim 1 and dependent claims) is not obvious over the cited references.

Table I (Example 3 vs. Comparative Example 2)

			Example 3	Comparative Example 2
Composition (vol%)	Phenolic resin		20	20
	Cashew dust		17	17
	Barium sulfate		27	20
	Aramid fibers		10	10
	Copper fibers		8	8
	Graphite		10	10
	Milled zirconium silicate (average particle size, 50 μm)			8
	Spherical zirconium silicate (average particle size, 50 μm)		8	
	Total		100	93
Friction test results	Friction coefficient	100°C	0.37	0.45
		200°C	0.36	0.44
	Mating surface wear (μm)	100°C	8	23
		200°C	4	13
	Noise performance	100°C	Excellent	Poor
		200°C	Excellent	Poor

Table II (Example 5 vs. Comparative Example 3)

			Example 5	Comparative Example 3
Composition (vol%)	Phenolic resin		20	20
	Cashew dust		17	17
	Barium sulfate		32	27
	Aramid fibers		10	10
	Copper fibers		8	8
	Graphite		10	10
	Milled zirconium silicate (average particle size, 100 μm)			3
	Spherical zirconium silicate (average particle size, 100 μm)		3	
	Total		100	95
Friction test results	Friction coefficient	100°C	0.37	0.46
		200°C	0.38	0.45
	Mating surface wear (μm)	100°C	9	25
		200°C	5	13
	Noise performance	100°C	Excellent	Poor
		200°C	Excellent	Poor

Information Disclosure Statement

Applicants appreciate the initialed PTO-1449 form submitted with the Information Disclosure Statement (IDS) filed on February 9, 2004, which was attached to the Office Action mailed September 27, 2005. However, Applicants note that the reference "Patent Abstracts of Japan, Vol. 0150, No. 76, 1991, (Publication No. 2298576)" listed on the form is crossed out.

Applicants believe that a copy of the reference should be in the Examiner's possession. However, for the Examiner's convenience, one (1) copy of the reference and the PTO-1449 Form which accompanied the same are attached hereto. The Examiner is respectfully requested to consider the reference and return a copy of the initialed PTO-1449 form to the undersigned.

CONCLUSION

Based upon the amendments and remarks presented herein, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of the pending claims 1 and 3- 12 are allowed under the provisions of Title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Gerald M. Murphy, Jr. (Reg. No. 28,977) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By _____
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